

USSN 09/435,461
Page 4

REMARKS

The Examiner is thanked for his thorough review of the application. Claims 1, 4-7, 10-13, 18 and 21-23 are pending. Claims 1, 4, 6-7, 11-12, 21 and 23 have been amended. Claims 5 and 17 have been cancelled to eliminate claim duplication. Applicants have attached hereto on a separate sheet a marked-up version of the amended claims. There are four independent claims remaining in the application; claims 1, 12, 21 and 23. No new matter has been added by this amendment.

Election of Species

Applicants hereby confirm the election of the species *Pseudomonas* as made by telephone of 7/19/2000, by Christopher Stone, as stated in paragraph 1 of the 8/23/00 office action.

Oath or Declaration

The Examiner required submission of a new oath or declaration. The new Declaration executed by the inventor is submitted herewith.

Abstract of the Disclosure

The Examiner required submission of a new abstract of the invention, and the new abstract is attached hereto on a separate sheet.

35 U.S.C. §112 Rejections

Claims 4-7, 11, 12, 17 and 23 have been rejected under 35 U.S.C. §112, second paragraph as indefinite. The dependency of claim 4 has been changed to claim 1 instead of to previously cancelled claim 2; the redundant use of *Pseudomonas* has been deleted from claim 11; and independent claim 17 has been cancelled in view of claim 12.

The examiner rejected claims 5-7, 11, 12 and 23 for use of the phrases "has at least 10% greater hydrolysis in a UV and/or MB assay than a similar method without the use of a polyesterase enzyme", "has at least 50% greater hydrolysis in a UV and/or MB assay than a similar method without the use of a polyesterase enzyme", and has at least 100% greater hydrolysis in a UV and/or MB assay than a similar method without the use of a polyesterase enzyme". Claim 5 has been cancelled to avoid claim duplication. Applicants have amended claims 6-7, 11, 12, 21 and 23 to properly state that the polyesterses suitable to practice the invention meet a standard which requires an increase in "absorbance", not "hydrolysis", of at least 10% (claims 1, 12), or at least 50% (claims 6, 21 and 23), or at least 100% (claim 7) as compared to controls without polyesterses when tested by an UV and/or a MB assay. It is believed that the amendment obviates the rejection of the Examiner and correctly states,

GC593AM

USSN 09/435,461
Page 5

please see page 9, lines 22-24, that the increase is in absorbance as compared to a blank control in the UV and/or MB assays.

35 USC §101 Rejection

The Examiner's § 101 rejection is obviated in view of the cancellation of independent claim 17.

35 USC §102(b) Rejection

Claims 1, 5-7, 10-13, 17, 21-23 are rejected as anticipated by WO 97/27237 or WO 99/01604 with the Examiner stating that:

The references teach that aromatic polyester fabrics such as poly(ethylene terephthalate) are treated with polyesterases such as lipases, esterases, etc. which will modify the surface of the polyester. The polyesterases are derived from sources such as Pseudomonas. The polyesterase of the method has at least 10%, 50% and 100% greater hydrolysis in a UV and/or MB assay than a similar method without the use of a polyesterase since the polyesterase will always have 100% greater hydrolysis in a UV assay compared to an assay without a polyesterase.

Applicants' amendments to the claims referred to above obviate the rejection by clarifying that the 10% (claims 1 and 12), 50% (claims 6, 21 and 23) and 100% (claim 7) increases are in absorbance, not hydrolysis, in UV and MB assays as compared to controls without polyesterase in those assays.

The '237 and '604 references were disclosed by Applicants, and the '604 reference and its differences from the instant invention are specifically discussed on page 9, lines 5-19, of Applicants' specification. The ETE and BEB assays discussed on pages 39-40 in the '604 reference constitute the "false positives" obtained from relying upon ETE and BEB test results to select enzymes, as discussed by Applicants on page 9, lines 5-19. As clearly supported by Applicants' Table 1 on page 18, all of the polyesterases found acceptable under the ETE and BEB standards of the cited references, referred to and the same as the DET results in Table 1, would not produce 10%, 50%, or 100% greater absorbance in a UV and/or MB assay than a control sample without polyesterase. The '604 patent and the '237 patent do not provide any results for UV and/or MB assays and do not teach the use of such standards or methods for selecting enzymes that will produce the desired modifications. The ETE and BEB standards used in the cited references are based solely upon mono- and di-ester molecule cleavages and therefore cannot predict whether particular enzymes will have activity against large repeating polymer fibers. The UV and/or MB assays as disclosed by Applicants do not predict whether enzymes will have activity against such large repeating polymer fibers.

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-Doesn't mean
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are not one
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GC593AM

USSN 09/435,461
Page 6

Applicants respectfully request that the rejection based upon the '406 and '237 patents be withdrawn in view of the amendments to claims 1, 6-7, 10-13, 17, 21-23 because none of the cited references provides for an increase of 10% (claims 1 and 12), or 50% (claims 6, 21 and 23), or 100% (claim 7) in absorbance in a UV and/or MB assay as compared to absorbance of a control.


35 U.S.C. §103(a)

The Examiner has rejected claim 4 as obvious over WO 97/27237 or WO 99/01604. The Examiner again states that:

The WO references teach that aromatic polyester fabrics such as poly(ethylene terephthalate) are treated with polyesterses such as lipases, esterases, etc. which will modify the surface of the polyester. The polyesterses are derived from sources such as Pseudomonas. The polyesterase of the method has at least 10%, 50% and 100% greater hydrolysis in a UV and/or MB assay than a similar method without the use of a polyesterase since the polyesterase will always have 100% greater hydrolysis in a UV assay compared to an assay without a polyesterase.

Again, it is believed that the rejection is obviated in view of the amendment to claim 1 since claim 4 depends from claim 1. Nothing in either of the cited references, alone or in combination, suggests use of a polyesterase which exhibits an increase of 10% (claims 1 and 12), or 50% (claims 6, 21, and 23), or 100% (claim 7) in absorbance in a UV and/or MB assay as compared to a control without polyesterase.

Applicants further wish to address the Examiner's statement that "The WO references do not specifically mention if the fabrics have stains on them or not, thus, the fabrics of the WO references do not have stains on them or in the very least it would have been obvious for one of ordinary skill in the art to use a fabric without a stain.....". Although the '237 reference states only that the process preferably takes place during the finishing (post treatment) step (page 3, lines 29-30), the '604 composition is specifically for use by end user wearers of polyester garments when they wash those garments which presumably would be soiled and include stains. Please see page 2, lines 2-5 of the '604 patent which states that the problem of the invention is as follows: "Solutions to this problem that can be applied by the end user of polyester fabrics have never been suggested, and the consumer still find pilling to be a problem that is encountered when wearing polyester fabrics and garments". Additional support for a presumption of soiled, stained garments may be found on page 5, lines 16-18, stating that "[T]he treatment is preferably carried out simultaneously with a conventional laundry process, and is carried out in presence of a detergent". The '604 patent includes an extensive discussion of detergents; suggests on page 6, lines 4-7 that the surfactant



GC593AM

USSN 09/435,461
Page 7


(detergent) "promotes, or at least does not degrade, the stability of any enzyme in these compositions"; and, claims carrying out the method in the presence of a detergent (claim 1) and with laundering of the fabric and/or garment (claim 6).

The Examiner also rejected claim 18 based upon the two cited references discussed above in view of GB 2,307,695. Applicants believe that the rejection is obviated in view of the amendment to claim 1 from which claim 18 depends. Nothing in any of the three references, together or alone, suggests using a polyesterase which exhibits an increase of 10% (claims 1 and 12), or 50% (claims 6, 21, and 23), or 100% (claim 7) in absorbance in a UV and/or MB assay as compared to a control without polyesterase.

In view of the amendments and remarks provided herewith, Applicants respectfully request the withdrawal of all pending rejections. Allowance of all pending claims is kindly requested.

Respectfully submitted,

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GC593AM

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USSN 09/435,461

Page 8

MARKED-UP VERSION OF ABSTRACT AND AMENDED CLAIMS**ABSTRACT**

[A method is provided for enzymatically modifying a polyester resin, film, fiber, yarn, fabric or textile to modify the characteristics thereof.] A polyesterase enzyme which produces a positive result in an UV and/or MB assay is used to treat polyester to modify polyester properties such as pilling, prilling prevention, weight, feel, appearance and luster.

IN THE CLAIMS

1. (Three Times Amended) A method for modifying the surface of an aromatic polyester resin, film, fiber, yarn or fabric comprising treating said polyester with a polyesterase enzyme which, in a UV and/or MB assay having a control without the polyesterase enzyme, produces at least a 10% greater absorbance than an absorbance of the control, the treatment occurring prior to the application of a finish and for a time and under conditions to modify the properties of said polyester, wherein [said treatment occurs prior to the application of a finish and] said modified properties of said treated polyester are selected from the group consisting of pilling, prilling prevention, weight, feel, appearance and luster properties of said polyester.
4. (Amended) The method according to claim [1] 2 wherein said polyester [fiber, yarn or fabric] is a textile product and does not comprise a stain.
6. (Twice amended) The method according to claim [5] 1, wherein said polyesterase has at least 50% greater [hydrolysis] absorbance than an absorbance of a control without the polyesterase enzyme in a UV and/or a MB assay [than a similar method without the use of a polyesterase enzyme].
7. (Three times amended) The method according to claim 6, wherein said polyesterase has at least 100% greater [hydrolysis] absorbance than an absorbance of a control without polyesterase enzyme in a UV and/or a MB assay [than a similar method without the use of a polyesterase enzyme].
11. (Amended) The method according to claim 7, wherein said polyesterase is derived from *Absidia* spp.; *Acremonium* spp.; *Agaricus* spp.; *Anaeromyces* spp.; *Aspergillus* spp.; *Aeurobasidium* spp.; *Cephalosporum* spp.; *Chaetomium* spp.; *Coprinus*

GC593AM

USSN 09/435,461
Page 9

spp.; Dactyllum spp.; Fusarium spp.; Gliocladium spp.; Helminthosporum spp.; Humicola spp.; Mucor spp.; Neurospora spp.; Neocallimastix spp.; Orpinomyces spp.; Penicillium spp.; Phanerochaete spp.; Phlebia spp.; Piromyces spp.; Pseudomonas spp.; Rhizopus spp.; Schizophyllum spp.; Trametes spp.; Trichoderma spp.; and Ulocladium spp.; Zygorhynchus spp.; Bacillus spp.; Cellulomonas spp.; Clostridium spp.; Myceliophthora spp.; [Pseudomonas spp.]; Thermomonospora spp.; Thermomyces spp.; Streptomyces spp.; Fibrobacter spp.; Candida spp.; Pichia spp.; Rhodotorula spp.; or Sporobolomyces spp..

12. (Twice Amended) A method for modifying the textile characteristics of a polyester article prior to the application of a finish to the article, comprising the steps of:

(a) obtaining a polyesterase enzyme, wherein said polyesterase enzyme has at least 10% greater [hydrolysis] absorbance than an absorbance of a control without polyesterase enzyme in an assay selected from a UV assay or a MB assay [compared to a similar assay without the use of said polyesterase enzyme];

(b) contacting said polyesterase enzyme with said polyester article under conditions and for a time suitable for said polyesterase to produce a modified polyester article; and

(c) producing a modified polyester article.

21. (Amended) A method for enzymatically modifying the characteristics of an unsoiled aromatic polyester textile comprising; treating said polyester, prior to the application of a finish, with a polyesterase enzyme which produces in a UV and/or MB assay at least a 50% greater absorbance than an absorbance of a control without the polyesterase enzyme, the treatment for a time and under conditions to modify the textile properties of said polyester, wherein said modified textile properties of the treated polyester comprise the pilling, pilling prevention, weight, feel, appearance or luster properties of said polyester.

23. (Amended) A method for modifying the surface of an aromatic polyester resin, film, fiber, yarn or fabric comprising, (a) contacting said polyester prior to application of a finish with a polyesterase enzyme solution derived from a *Pseudomonas* spp, wherein said polyesterase enzyme has at least 50% greater [hydrolysis] absorbance in an assay selected from a UV assay and a MB assay compared to a similar assay without the use of

GC593AM

USSN 09/435,461
Page 10

said polyesterase enzyme, and (b) allowing said polyester to be modified, wherein said modified properties include the pilling, pilling prevention, weight, feel, appearance or luster of said polyester.

GC593AM

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USSN 09/435,461
Page 11

ABSTRACT

C9 A polyesterase enzyme which produces a positive result in an UV and/or MB assay is used to treat polyester to modify polyester properties such as pilling, pilling prevention, weight, feel, appearance and luster.

GC593AM

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